

# 30-Day Launch Forecast

17 August 2000

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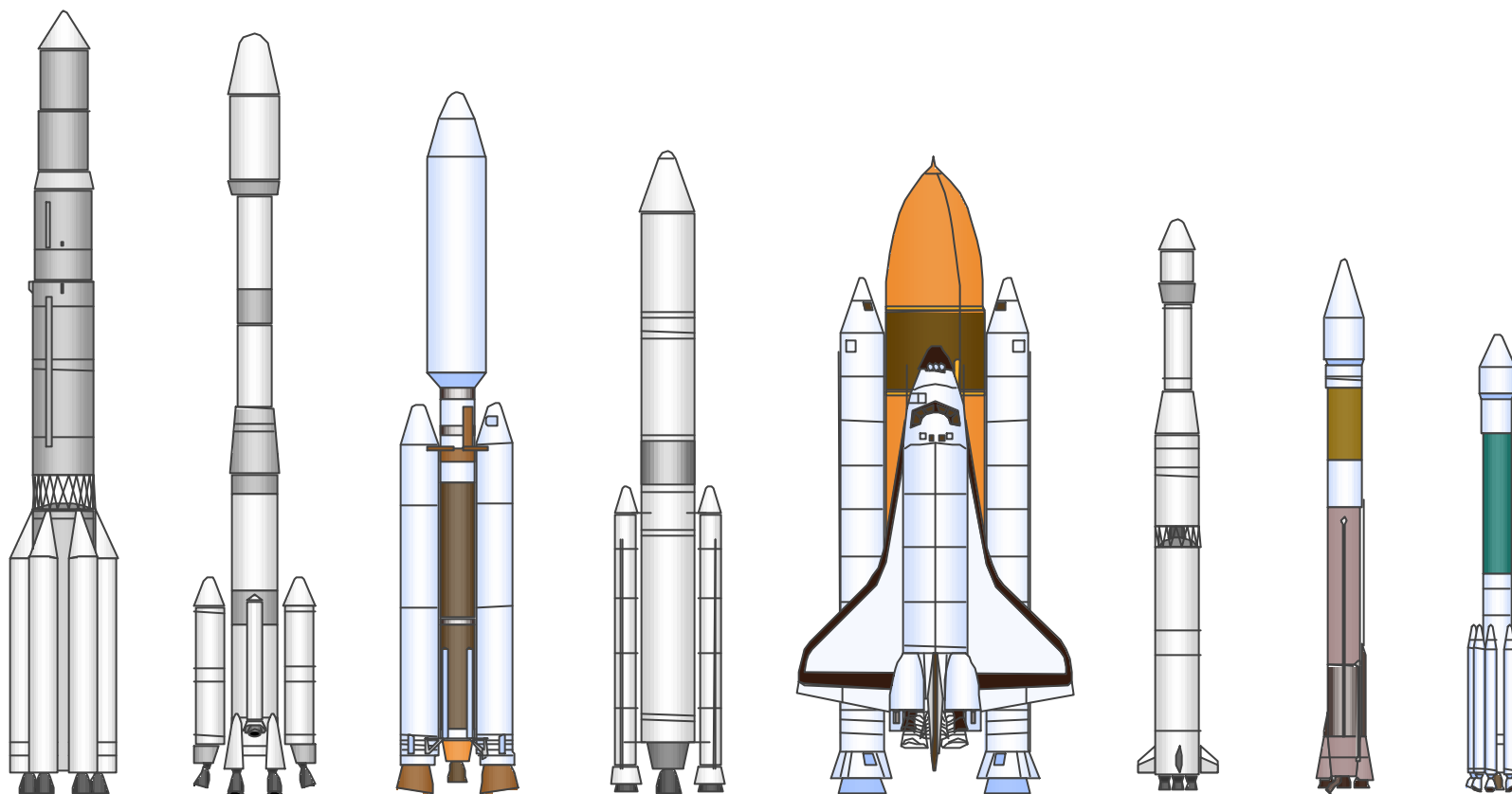
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ANSER Space Analysis Division

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# 30-Day Launch Forecast

## (17 August 2000 - 15 September 2000)

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Comments / Schedule Changes										
<b><u>A Look Ahead</u></b> 24 Sep Zenit 2 28 Sep Minuteman III 28 Sep Minuteman III 05 Oct STS-92 06 Oct Pegasus XL 12 Oct Atlas 2A 30 Oct Titan 4B All foreign launches presented in this forecast are unofficial			17 Titan 4B NRO SLC-4E VAFB 1800-2200 EDT	18 Ariane 44LP Brasilsat B-4 Nilesat 102 ELA-2 CSG 1916-1958 EDT	19	20	Titan 4B / NRO; Mission B-28 • Classified military satellite • No Upper Stage (NUS/403 configuration) Ariane 44LP / Brasilsat B-4 / Nilesat 102; Flight 131 • Brasilsat B-4: Brazilian communications satellite • Nilesat 102: Egyptian communications satellite Delta 3 / DM-F3; Flight 280 • Demonstration flight with dummy payload to prove vehicle flightworthiness										
21	22	23	24	25	26	27	Zenit 2 / Cosmos 2372 • Russian military satellite Dnepr / Saudisat 1-A & 1-B / UNISAT / Megsat 1 / TiungSat 1 • Saudisat: Saudi Institute for Space Research • UNISAT: University of Rome microsatellite • Megsat 1: Italian data relay satellite • TiungSat 1: Malaysian remote sensing payload										
28	29	30	31	1 Sep	2	3	Proton / Globus-1 • Russian military communications satellite  Proton / Sirius-2 • Satellite-to-car radio broadcast system • Formerly known as CD Radio  Ariane 44LP / Eutelsat W1; Flight 132 • Eutelsat W1: TV/radio distribution to Europe										
4	5	6	7	8	9	10	STS-106 Atlantis / Spacehab-DM; ISS 2A.2b • Fourth US shuttle flight for International Space Station (ISS); resupply mission  Titan 2 (G-13) / NOAA-L • Meteorological satellite Ariane 506 / Astra-2B / GE-7; Flight 130 • Astra-2B: SES of Luxembourg communications system • GE-7: GE Americom communications satellite										
11	12	13	14	Last Week's Launch Activities													
				<table><thead><tr><th>Date</th><th>Vehicle</th><th>Payload</th><th>Site</th><th>Type</th></tr></thead><tbody><tr><td colspan="5">No Launch Activities Last Week</td></tr></tbody></table>				Date	Vehicle	Payload	Site	Type	No Launch Activities Last Week				
Date	Vehicle	Payload	Site	Type													
No Launch Activities Last Week																	
				Launch Date provided in Universal Time													

Launch Date provided in Universal Time

Acronyms: VAFB - Vandenberg AFB CA  
SLC - Space Launch Complex

CCAFS - Cape Canaveral AFS FL  
LC - Launch Complex

KSC - Kennedy Space Center FL  
LF - Launch Facility

CSLF - Calif. Space Launch Facility  
EDT - Eastern Daylight Time

NET - No Earlier Than  
EST - Eastern Standard Time

WFF - Wallops Flight Facility  
CSG - Guiana Space Center

# Titan 4B



## Current Mission Specifics

30th launch of the Titan 4 launch vehicle

### Reliability History:

- Titan 4-A: 20 successes in 22 attempts
- Titan 4-B: 5 successes in 7 attempts

### Typical Launch Sequence

• Stage 0 Ignition	0	sec
• Stage 1 Ignition	120	sec
• Stage 0 Separation	152	sec
• Payload Fairing Separation	230	sec
• Stage 2 Ignition	308	sec
• Stage 1 Separation	309	sec
• Stage 2 Shutdown	532	sec
• Stage 2 Jettison	558	sec

Payload Weight: Classified NRO (B-28); N/A

### Next Titan 4B launch

- 30 October 2000 / Milstar-4 (B-41)

## Background Information

First Launch:	February 1997
Flight Rate:	3-4 per year
Launch Sites:	SLC-40 & SLC-41 (CCAFS, USA); SLC-4E (VAFB, USA)
Capability:	48,280 lb to LEO; 39,000 lb to polar LEO; 19,000 lb to GTO; 12,725 lb to GEO (with Centaur)

## History

- USAF Titan ICBM program started in 1950s.
- Titan 4 program started as Complimentary Expendable Launch Vehicle (CELV).
- Direct descendant of Titan 34D.
- Titan 4B program adds Solid Rocket Motor Upgrade. SRMU changes from SRM: increases payload mass capability by 25%, graphite composite casing (vs steel), HTPB (vs PBAN), 3 field joints (vs 7), 12% heavier, 5% wider.

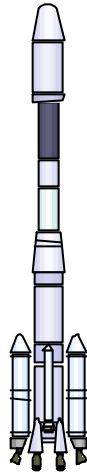
## Description

- Two or three-stage (including Centaur or IUS) vehicle plus two strap-ons.
- Stage 0: Two 3-segment Alliant Techsystems SRMUs, generate 1,701,450 lb of thrust each.
- Stage 1: Two Aerojet LR-87 engines burn  $N_2O_4/A-50$ , generating 547,605 lb of thrust total.
- Stage 2: One Aerojet LR-91 engine burns  $N_2O_4/A-50$ , generating 106,200 lb of thrust.
- Centaur upper stage uses two Pratt & Whitney RL10-3-3A engines burning LOX/LH<sub>2</sub> producing 33,000 lb of total thrust.
- Titan 4 available in three configurations: Titan 401/Centaur Upper Stage; Titan 402/Inertial Upper Stage (IUS); Titan 403/No Upper Stage (NUS).

## Profile

Length:	204 ft	Launch Weight:	2,070,785 lb (Centaur)
Diameter:	10 ft	Liftoff Thrust:	3,402,900 lb
Payload Fairing:	56 (NUS), 66 (IUS), 76 (IUS), and 86 (Centaur) ft x 16 ft		

# Ariane 44LP



## Current Mission Specifics

130th launch of the Ariane vehicle

### Reliability History

- Ariane: 121 successes in 129 attempts
- Ariane 4: 93 successes in 96 attempts

### Typical Launch Sequence

- |                            |       |     |
|----------------------------|-------|-----|
| • First Stage Ignition     | 0     | sec |
| • Solid Ignition           | 4.2   | sec |
| • Lift-off                 | 4.4   | sec |
| • Solid Boosters Jettison  | 67    | sec |
| • Liquid Boosters Jettison | 156   | sec |
| • First Stage Separation   | 212   | sec |
| • Second Stage Ignition    | 215   | sec |
| • Fairing Jettison         | 285   | sec |
| • Second Stage Separation  | 343   | sec |
| • Third Stage Ignition     | 348   | sec |
| • Third Stage Shutdown     | 1,134 | sec |
| • Orbit Injection          | 1,135 | sec |
| • Spacecraft Separation    | 1,232 | sec |

Payload Weight: Brasilsat B-4: 3,873 lb (at launch)  
Nilesat 102: 4,028 lb (at launch)

Orbit: Geostationary at 92° West (B-4) & 7° West (102)

### Next Ariane Launch

- 6 September 2000 / Ariane 44P / Eutelsat W1

## Background Information

First Launch: June 1988  
Flight Rate: 9-12 Ariane 4s per year  
Launch Site: ELA-2 (Kourou, French Guiana)  
Capability: 19,180 lb to LEO; 9,305 lb to GTO

## History

- European Space Agency began Ariane development in 1973.
- First Ariane 1 flight in December 1979.
- First Ariane 4 flight in June 1988.

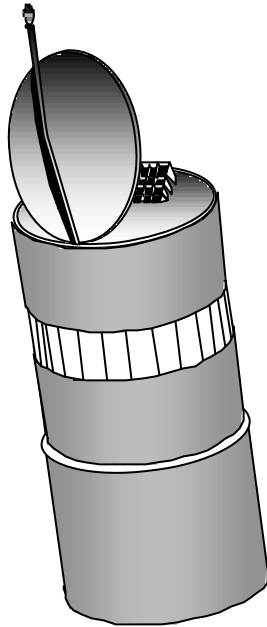
## Description

- Three-stage vehicle with two strap-on solid boosters and two strap-on liquid boosters.
- Stage 1 burns UH<sub>25</sub>/N<sub>2</sub>O<sub>4</sub> in four Viking 5C engines, generating a total thrust of 611,550 lb.
- Stage 2 burns UH<sub>25</sub>/N<sub>2</sub>O<sub>4</sub> in one Viking 4B engine, generating 179,550 lb of thrust.
- Stage 3 burns LH<sub>2</sub>/LOX in one HM-7B engine, generating 14,580 lb of thrust.
- Two solid strap-ons (PAP) burn CTPB, generating 146,250 lb of thrust each.
- Two liquid strap-ons (PAL) burn UH<sub>25</sub>/N<sub>2</sub>O<sub>4</sub> in Viking 6 engines, generating 150,750 lb of thrust each.

## Profile

Length:	184.9 ft	Launch Weight:	928,135 lb
Diameter:	12.5 ft	Liftoff Thrust:	1,185,750 lb
Payload Fairings:	28.3 ft; 31.6 ft; 36.5 ft x 13.1 ft		

# Brasilsat B-4



## Spacecraft Specifications

### Weight:

- 3,873 lb (at liftoff)
- 1,808 lb (on orbit, BOL)

### Dimensions:

- Diameter: 12 ft
- Height in Orbit: 27.2 ft
- Height at Launch: 11.3 ft

## Brasilsat B-4

Brazilian Embratel second generation telecommunications satellite.

## Mission

Provide basic telecommunications services: telephone, television, facsimile and data transmission, and business networks for Brazil.

## Description

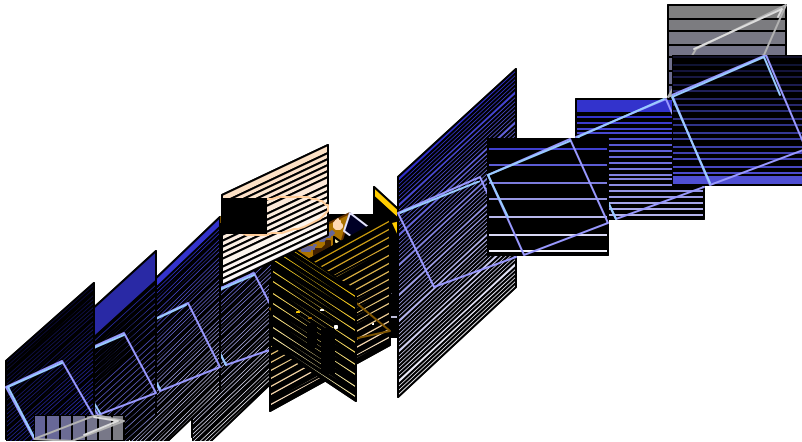
### Spacecraft Description:

- Hughes HS-376W communications satellite.
- Spin stabilized at 50 rpm with hydrazine thrusters.
- 28 active 33 MHz C-band transponders powered by 24 SSPAs with 15.3 W and four with 16.5 W Hughes-developed solid-state power amplifiers (SSPAs); 17.3-17.7 GHz frequency bands; EIRP varies from 33 to 41 dBW.
- Power: 1,660 W (BOL) provided by two cylindrical, telescoping solar panels covered with large-area silicon solar cells; 18-cell  $\text{NiH}_2$  battery provides power during eclipses.
- Design life: 12 years.

Orbit: Geosynchronous, positioned at 92° West

Prime Contractor: Hughes Space and Communications Group

# Nilesat 102



## Spacecraft Specifications

### Weight:

- 4,028 lb (total at launch)
- 1,792 lb (dry mass)

### Dimensions:

- Main Body: 7.5 x 7.9 x 5.6 ft
- Solar Arrays: 70.5 ft

## Nilesat 102

Second satellite of the Nilesat consortium of Egyptian companies providing Direct to Home (DTH) video services to the state-owned Egyptian Radio & Television Union (ERTU).

## Mission

Generate up to 100 DTH channels via 60 cm dishes over a region from Morocco in the west to the Arabian Gulf in the east.

## Description

### Spacecraft Description:

- Eurostar 2000 platform.
- 12 (plus 6 backup; 18-for-12) 100 W 17.3-17.7 GHz Ku-band 33 MHz bandwidth transponders, providing 47.3-53.0 dBW EIRP; optimized for digital multimedia DTH applications.
- Single 7.5 ft diameter transmission antenna.
- On-board power: 3,750 W (EOL).
- Design life: 12 years.

Orbit: Geosynchronous at 7° West

Prime Contractor: Astrium SAS (France)

# Delta 3



## Current Mission Specifics

280th launch of the Delta vehicle

### Reliability History

- Delta: 263 successes in 279 attempts
- Delta 3: 0 successes in 2 attempts

### Typical Launch Sequence

- |                              |       |     |
|------------------------------|-------|-----|
| • Ignition (Main & 6 Solids) | 0     | sec |
| • Solid Motor Ignition (3)   | 78    | sec |
| • Solid Motor Jettison (6)   | 79    | sec |
| • Solid Motor Jettison (3)   | 157   | sec |
| • Main Engine Cutoff         | 261   | sec |
| • Stage 1/2 Separation       | 269   | sec |
| • Fairing Jettison           | 286   | sec |
| • Second Engine Cutoff (S1)  | 778   | sec |
| • Second Engine Restart      | 1,321 | sec |
| • Second Engine Cutoff (S2)  | 1,528 | sec |
| • Spacecraft Separation      | 2,171 | sec |

Payload Weight: DM-F3; 9,500 lb (at launch)

Orbit: N/A

Next Delta 3 launch

- TBA

## Background Information

First Launch:	August 1998 (Launch Failure)
Flight Rate:	18 per year (maximum)
Launch Site:	SLC-17B (CCAFS)
Capability:	18,400 lb to LEO; 8,400 lb to GTO

## History

- Delta program initiated by NASA in 1959.
- Incorporated components from USAF's Thor and USN's Vanguard.
- First Delta vehicle launched in May 1960.
- Delta 3 is enhanced version of Delta 2.

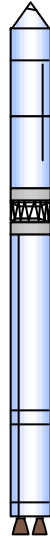
## Description

- Two-stage vehicle.
- Stage 1 incorporates nine stretched versions of Alliant Techsystems solid propellant Graphite Epoxy Motors (GEMs) producing 136,700/141,300 (ground/air-lit) lb of thrust each. The new, more powerful GEMs feature a Thrust Vector Control (TVC) system.
- Stage 1 uses one Rocketdyne RS-27A engine that burns LOX/RP-1, generating 201,000 lb of thrust.
- Stage 2 utilizes one cryogenic Pratt & Whitney RL10B-2 engine that burns LH<sub>2</sub>/LOX and generates 24,750 lb of thrust.

## Profile

Length:	128.3	Launch Weight:	660,000 lb
Diameter:	13.1 ft	Liftoff Thrust:	1,021,200 lb
Payload Fairing:	35.5 ft x 13.3 ft		

# Zenit 2



## Current Mission Specifics

34th launch of a Zenit 2 Launch Vehicle

### Reliability History

- Orbital: 25 successes in 31 attempts
- Total: 25 successes in 33 attempts

### Typical Launch Sequence

- |                             |         |
|-----------------------------|---------|
| • Liftoff                   | 0 sec   |
| • 2nd stage steering begins | 130 sec |
| • 1st stage separation      | 150 sec |
| • Payload fairing jettison  | 165 sec |
| • Stage 2 shutdown          | 350 sec |
| • Orbit Injection           | 450 sec |

Payload Weight: Cosmos military spacecraft

Orbit: Not Available

Next Zenit 2 launch

- 24 September 2000 / Badr-2

## Background Information

First Launch:	April 1985 (sub-orbital)
Flight Rate:	Five per year (maximum recorded launch rate)
Launch Site:	Baikonur, Kazakhstan
Capability:	30,300 lb to LEO; 25,090 lb to Polar orbit

## History

- Developed in the early 1980s as a space launch vehicle (not derived from an ICBM) by NPO Yuzhnoye (Ukraine).
- Originally planned to replace the Soyuz for carrying crews and supplies to the Mir space station.
- Features automated fueling and launch processing.
- Used as strap-on booster for the Energia/Buran launch system.
- Primarily used to launch military ELINT satellites.

## Description

- Two-stage liquid-fueled vehicle (third stage proposed for GEO missions).
- Stage 1 has one RD-171 booster engine (one turbopump with four separate combustion chambers) burning LOX/kerosene fed from stage 1 tanks, generating 1,633,275 lb of thrust.
- Stage 2 has one RD-120 sustainer engine plus one RD-8 vernier (one turbopump with four separate combustion chambers) burning LOX/kerosene fed from stage 2 tanks generating, a total of 205,175 lb of thrust.

## Profile

Length:	187 ft	Launch Weight:	989,865 lb
Diameter:	12.8 ft	Liftoff Thrust:	1,633,275 lb
Payload Fairings:	36.6 ft x 12.8 ft; 44.8 ft x 12.8 ft		



# Dnepr



## Current Mission Specifics

2nd launch of the Dnepr vehicle

### Reliability History

- 1 success in 1 attempt

### Typical Launch Sequence

- Not Available

Payload Weight: Not Available

Orbit: Circular LEO

Next Dnepr launch

- TBD

## Background Information

First Launch: April 1999

Flight Rate: 25-27 per year (projected)

Launch Site: Baikonur, Kazakhstan

Capability: 9,700 lb to 162 nm LEO (46.2°); 5,300 lb to 162 nm SSO (97.8°)

## History

- Developed from the SS-18 (Satan) ICBM.
- Over 150 successful test launches as an ICBM system.
- Production of SS-18 missiles ended in 1991 under terms of START treaty.
- Approximately 150 SS-18 ICBMs currently available for conversion to Dnepr launch vehicles.

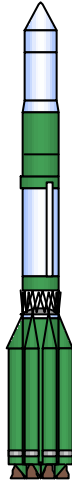
## Description

- Three-stage, silo-launched vehicle.
- Stage 1 liquid-propellant booster produces 1,016,760 lb of thrust.
- Stage 2 liquid-propellant booster produces 170,855 lb of thrust.
- LiFt upper stage developed by Lavochkin NPO utilizes one S5.98 engine that burns UDMH/N<sub>2</sub>O<sub>4</sub> and generates approximately 4,400 lb of thrust.
- C5M upper stage (also available) utilizes one Yuzhnoye 11D25M engine that burns UDMH/N<sub>2</sub>O<sub>4</sub> and generates 17,225 lb of thrust.

## Profile

Length:	112.5	Launch Weight:	591,495 lb
Diameter:	9.8 ft	Liftoff Thrust:	1,016,760 lb
Payload Fairing:	17.2 ft x 9.8 ft (medium); 25.4 ft x 9.8 ft (extended)		

# Proton



## Current Mission Specifics

198th launch of the Proton since 1980

### Reliability History (Since 1980)

- 185 successes in 197 attempts

### Typical Launch Sequence

- Stage 1 Ignition (10% thrust) -10.0 sec
- Stage 1 thrust 100% 0.0 sec
- Liftoff 0.57 sec
- Stage 2 ignition 116.91 sec
- Stage 1/2 separation 121.11 sec
- Stage 3 vernier ignition 330.0 sec
- Stage 2 shutdown 332.7 sec
- Stage 2/3 separation 333.4 sec
- Stage 3 main ignition 335.8 sec
- PLF jettison 351.0 sec
- Stage 3 main engine S/D 567.11 sec
- Stage 3/4 separation 582.01 sec
- Block 4 orbit insertion events TBD

Payload weight: Globus-1; Not Available

Orbit: Not Available

Next Proton launch:

- 5 September 2000 / Sirius-2

## Background Information

First Launch: July 1965

Flight Rate: 13 per year (maximum recorded launch rate)

Launch Site: Baikonur, Kazakhstan

Capability: 44,100 lb to LEO; 10,580 lb to GTO; 5,730 lb to GEO

## History

- Originally intended as a ballistic missile but converted to a space launch vehicle during development.
- Two, three, and four-stage versions were developed.
- Integrated by the Khrunichev state space center.
- Used to launch satellites into GEO, interplanetary spacecraft, and manned space stations such as Salyut and Mir.

## Description

- Three (SL-13) or four-stage (SL-12) liquid-fueled vehicle.
- Stage 1 has six strap-on boosters with RD-253 engines burning  $N_2O_4$  fed from the core stage 1 tank with UDMH fuel carried in the strap-on tanks, generating a total of 1,980,000 lb of thrust.
- Stage 2 has four RD-0210 sustainer engines burning  $N_2O_4$ /UDMH fed from stage 2 tank, generating a total of 534,600 lb of thrust.
- Stage 3 has one RD-0210 engine with four verniers burning  $N_2O_4$ /UDMH, generating a total thrust of 140,650 lb.
- Stage 4 Block DM has one restartable RD-58 burning LOX/kerosene, generating a total thrust of 19,125 lb.
- Proton M uses Breeze M Stage 4 with single fixed restartable DB Khimmash engine burning  $N_2O_4$ /UDMH, generating 4,415 lb of thrust.

## Profile

Length: 189.5 ft

Launch Weight: 1,521,175 lb

Diameter: 24.3 ft

Liftoff Thrust: 1,980,000 lb

Payload Fairing: 32.8 ft x 14.3 ft

# Space Launch Activities

## 2000 Year To Date

### United States Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
18 Jan	Minuteman II	IFT-4	VAFB, LF-03	Missile Defense (MIL)
21 Jan	Atlas 2A	DSCS-B8	CCAFS, SLC-36A	Communications (MIL)
27 Jan	Minotaur	JAWSAT	VAFB, SLC-7	Technology Demo (MIL)
03 Feb	Atlas 2AS	Hispasat 1-C	CCAFS, SLC-36B	Communications (COM)
08 Feb	Delta 2	Globalstar-14	CCAFS, SLC-17B	Communications (COM)
11 Feb	STS-99	SRTM	KSC, LC-39A	Radar Mapping (CIV)
08 Mar	Peacekeeper	GT-29-PA	VAFB, LF-05	FOT&E (MIL)
12 Mar	Taurus	MTI	VAFB, 576-E	Technology Demo (MIL)
12 Mar*	Sea Launch	ICO F-1	Pacific Ocean	Communications (COM)
25 Mar	Delta 2	IMAGE	VAFB, SLC-2W	Science (CIV)
03 May	Atlas 2A	GOES-L	CCAFS, SLC-36A	Meteorology (CIV)
08 May	Titan 4B	DSP-20	CCAFS, SLC-40	Early Warning (MIL)
11 May	Delta 2	GPS IIR-4	CCAFS, SLC-17A	Navigation (MIL)
19 May	STS-101	ISS 2A.2a	KSC, LC-39A	ISS Resupply (CIV)
24 May	Minuteman III	FTM-02	VAFB, LF-09	Flight Test Missile (MIL)
24 May	Atlas 3A	Eutelsat-W4	CCAFS, SLC-36B	Communications (COM)
07 Jun	Pegasus XL	TSX-5	VAFB	Science (MIL)
09 Jun	Minuteman III	GT-172-GM	VAFB, LF-10	FOT&E (MIL)
30 Jun	Atlas 2A	TDRS-H	CCAFS, SLC-36A	Communications (CIV)
08 Jul	Minuteman II	IFT-5	VAFB, LF-03	Missile Defense (MIL)
14 Jul	Atlas 2AS	EchoStar-6	CCAFS, SLC-36B	Communications (COM)
16 Jul	Delta 2	GPS IIR-5	CCAFS, SLC-17A	Navigation (MIL)
19 Jul	Minotaur	MightySat II.1	VAFB, CSLF	Technology Demo (MIL)
28 Jul	Sea Launch	PAS-9	Pacific Ocean	Communications (COM)

### French Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
25 Jan	Ariane 42L	Galaxy-10R	CSG, ELA-2	Communications (COM)
18 Feb	Ariane 44LP	SUPERBIRD-4	CSG, ELA-2	Communications (COM)
21 Mar	Ariane 505	INSAT-3B/ AsiaStar	CSG, ELA-3	Communications (COM)
19 Apr	Ariane 42L	Galaxy 4-R	CSG, ELA-2	Communications (COM)

### Chinese Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
25 Jan	LM 3A	Zhongxing-22	Xichang	Communications (CIV)
25 Jun	LM 3	Fengyun-2B	Xichang	Meteorological (CIV)

### Indian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
No Launches to Date				

### Japanese Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
10 Feb*	M-5	ASTRO-E	Kagoshima	Science (CIV)

### Brazilian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
No Launches to Date				

\* Indicates Launch Failure  
Launch Date provided in Universal Time

# Space Launch Activities

## 2000 Year To Date

### Russian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
01 Feb	Soyuz-U	Progress M1-1	Baikonur	Mir Resupply (CIV)
03 Feb	Zenit 2	Cosmos 2369	Baikonur	Signal Intelligence (MIL)
08 Feb	Soyuz-Fregat	IRDT	Baikonur	Technology Demo (COM)
12 Feb	Proton	Garuda-1	Baikonur	Communications (COM)
12 Mar	Proton	Express-6A	Baikonur	Communications (CIV)
20 Mar	Soyuz-Fregat	Dumsat	Baikonur	Technology Demo (COM)
04 Apr	Soyuz-U	Soyuz TM-30	Baikonur	Mir Resupply (CIV)
17 Apr	Proton	SESat	Baikonur	Communications (COM)
25 Apr	Soyuz-U	Progress M1-2	Baikonur	Mir Resupply (CIV)
03 May	Soyuz-U	Cosmos 2370	Baikonur	Classified (MIL)
16 May	Eurockot	SIMSAT-1 & -2	Plesetsk	Demo Flight (COM)
06 Jun	Proton	Gorizont-45	Baikonur	Communications (CIV)
24 Jun	Proton	Express-3A	Baikonur	Communications (CIV)
28 Jun	Kosmos 3M	Nadezhda/ Tsinghua-1/ SNAP-1	Plesetsk	Navigation (CIV) Remote Sensing (CIV) Technology Demo (CIV)
30 Jun	Proton	Sirius-1	Baikonur	Communications (COM)
04 Jul	Proton	Cosmos 2371	Baikonur	Data Relay (MIL)
12 Jul	Proton	Zvezda	Baikonur	ISS (CIV)
15 Jul	Kosmos 3M	CHAMP/ MITA/ RUBIN	Plesetsk	Science (CIV) Technology Demo (CIV) Science (CIV)
16 Jul	Soyuz-Fregat	Cluster II (a)	Baikonur	Science (CIV)
06 Aug	Soyuz-U	Progress M1-3	Baikonur	ISS Resupply (CIV)
09 Aug	Soyuz-Fregat	Cluster II (b)	Baikonur	Science (CIV)

### Launch Market Analysis

#### By Country

	<u># of Launches</u>	<u>Percent of Market</u>
US	13	33.3%
Russia	19	48.7%
France	4	10.3%
China	2	5.1%
Japan	1	2.6%

#### By Mission

	<u># of Launches</u>	<u>Percent of Market</u>
US Military	4	10.83%
US Civil	3	7.7%
US Commercial	6	15.4%
World Military	3	7.7%
World Civil	13	33.3%
World Commercial	10	25.6%

#### By Orbit Type (Commercial Only)

<u>GEO</u>	<u># of Launches</u>	<u>Percent of Market</u>
US	4	40.0%
Russia	2	20.0%
France	4	40.0%
China	0	0.0%
Japan	0	0.0%

<u>LEO</u>	<u># of Launches</u>	<u>Percent of Market</u>
US	2	33.3%
Russia	4	66.7%
France	0	0.0%
China	0	0.0%
Japan	0	0.0%

Figures Do Not Include US Space Shuttle, Small Launch Vehicles, or ICBM launches

\* Indicates Launch Failure

Launch Date provided in Universal Time

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